

Coral Reefs and Climate Change: An Integrated Approach



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Approximately 30% of Reefs Have Been Negatively Impacted by Human Activities



Nuclear Testing: Extreme/Acute Disturbance



Anthropogenic Disturbance

Erosion & Sedimentation



Overfishing



Coastal Pollution

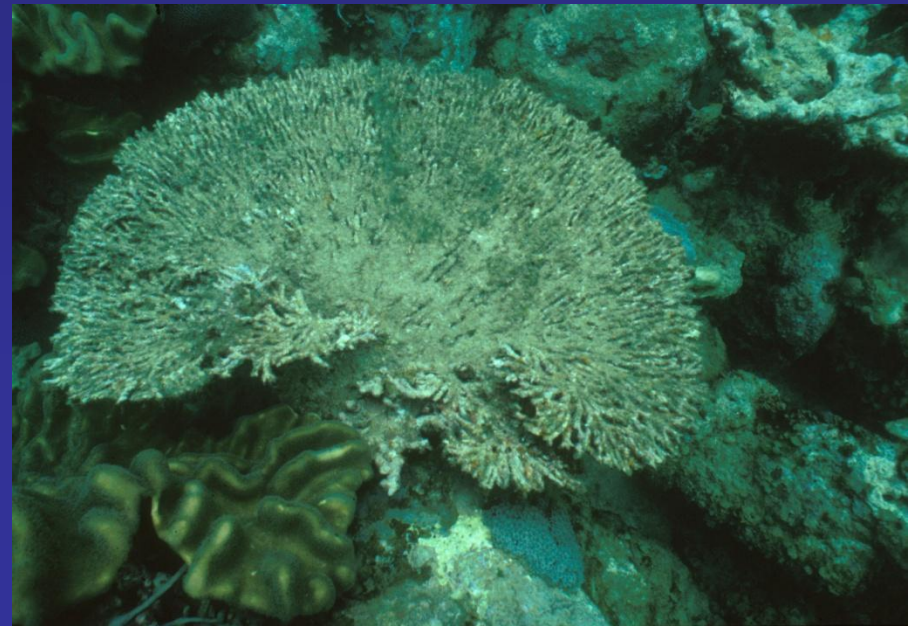


Recreational Impacts



Global Climate Change

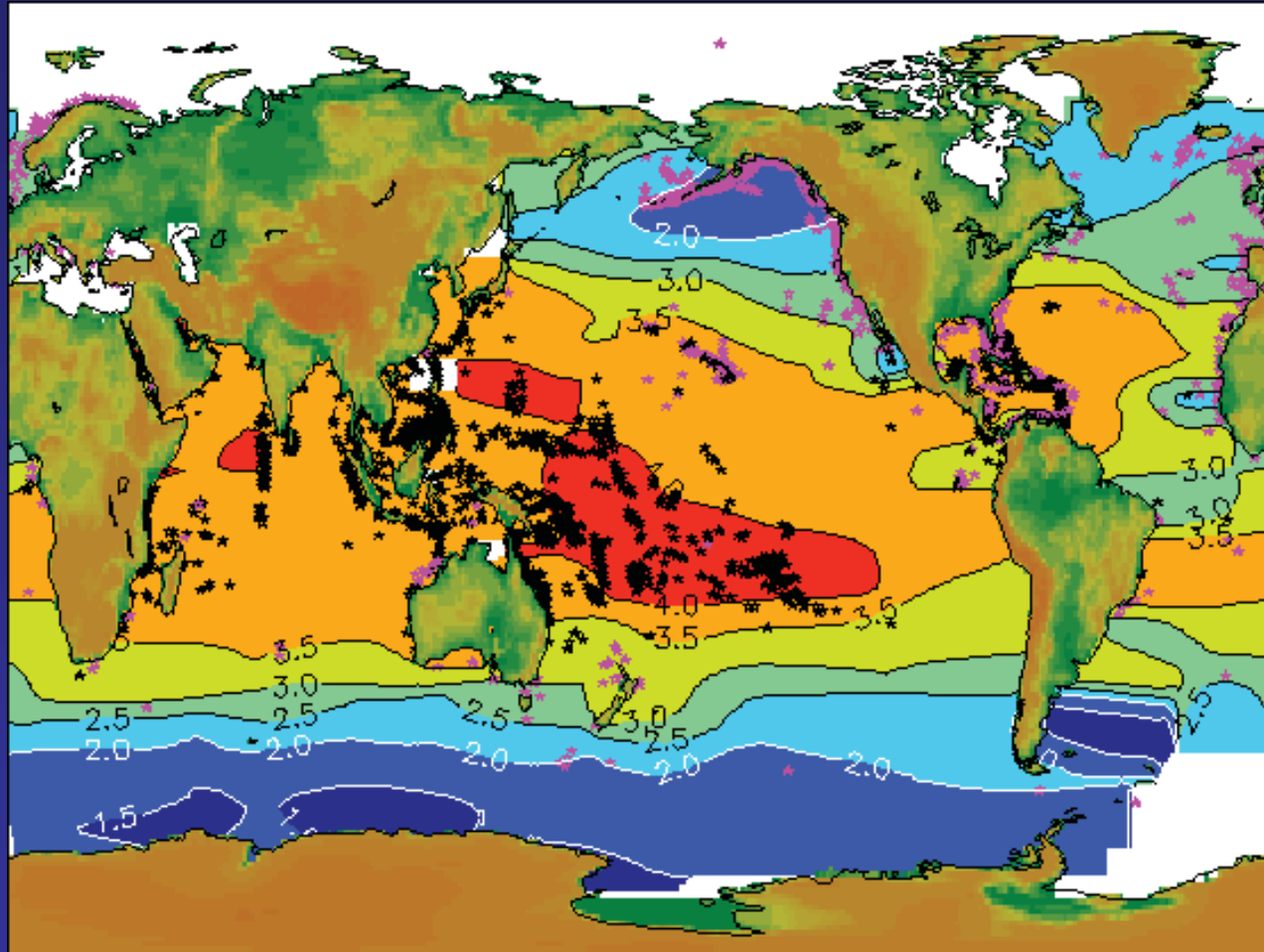
- Massive Regional Bleaching Events
- Alternate Stable States
- Ocean Acidification
- Irish Potato Famine of Reefs



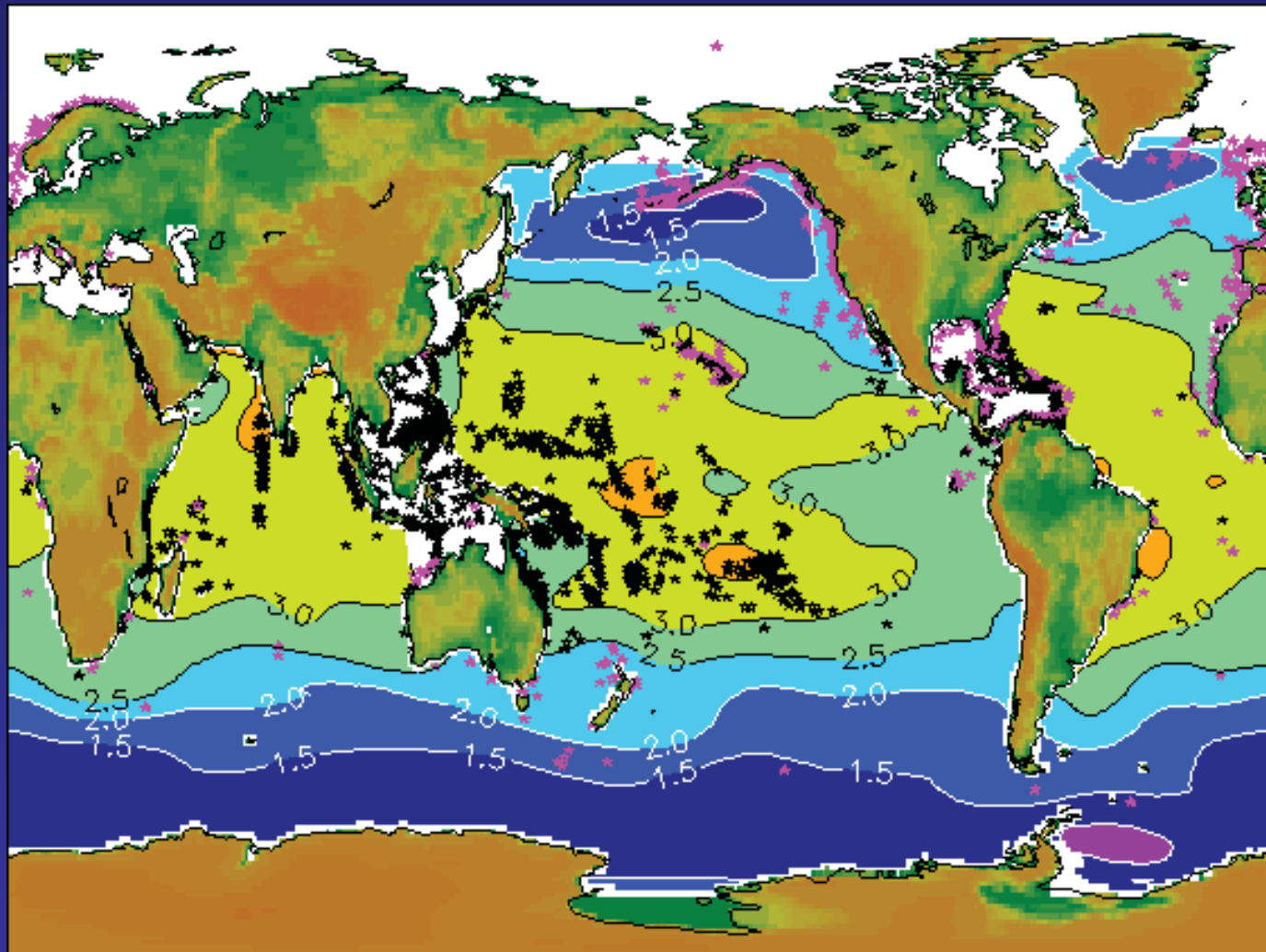
Global Climate Change

- “It has been suggested that to save reefs, we cannot exceed 450ppm CO₂ in seawater. At the world's current rate of CO₂ emissions, we have 8-10 years to turn the tide”
- (summary, 11th ICRS, Ft. Lauderdale, 2008)

Aragonite Saturation Levels in 1995



Aragonite Saturation Levels in 2040

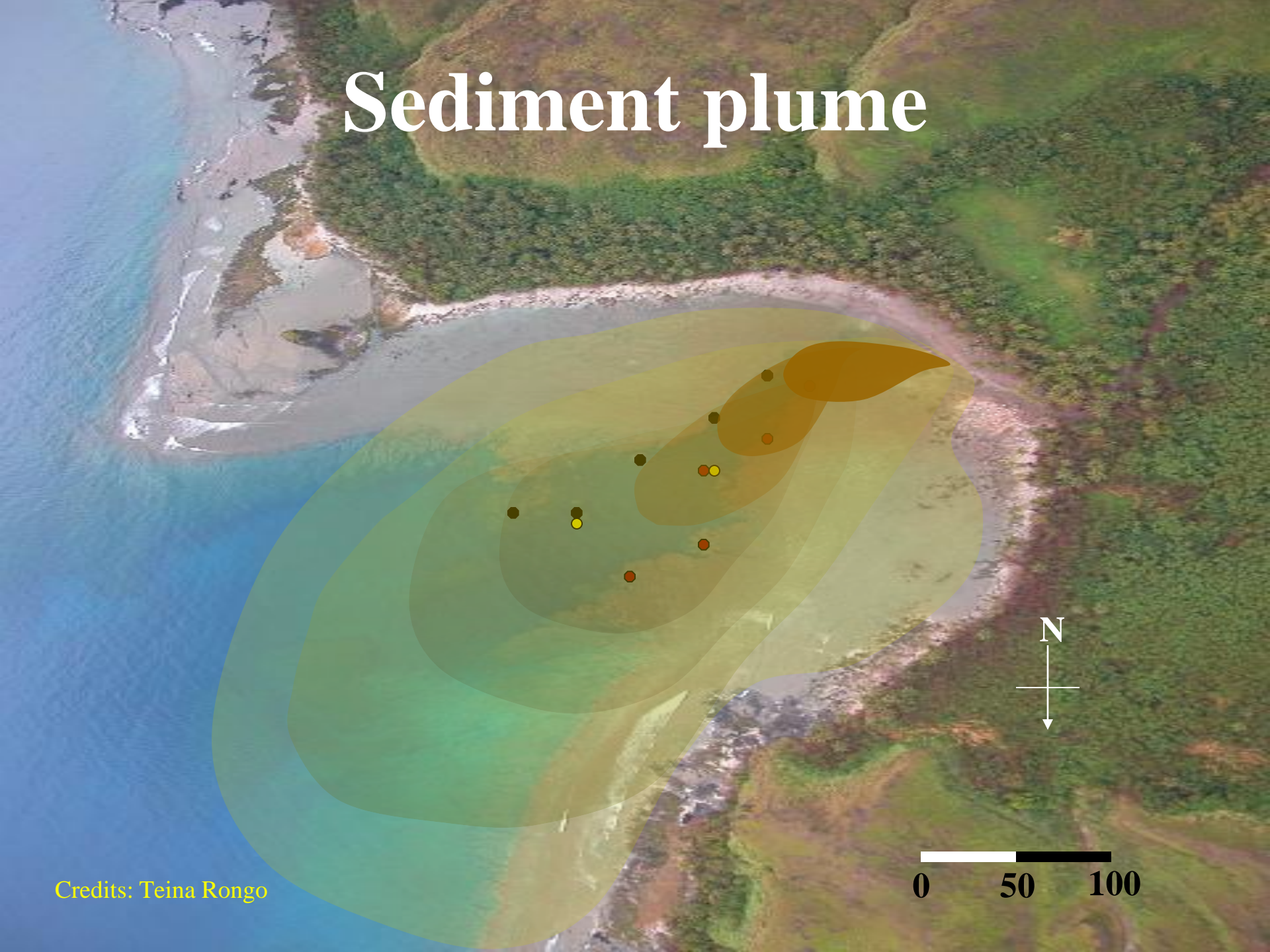


Ocean acidification effects

Persistence and Perpetuation of Coral Reefs



Sediment plume

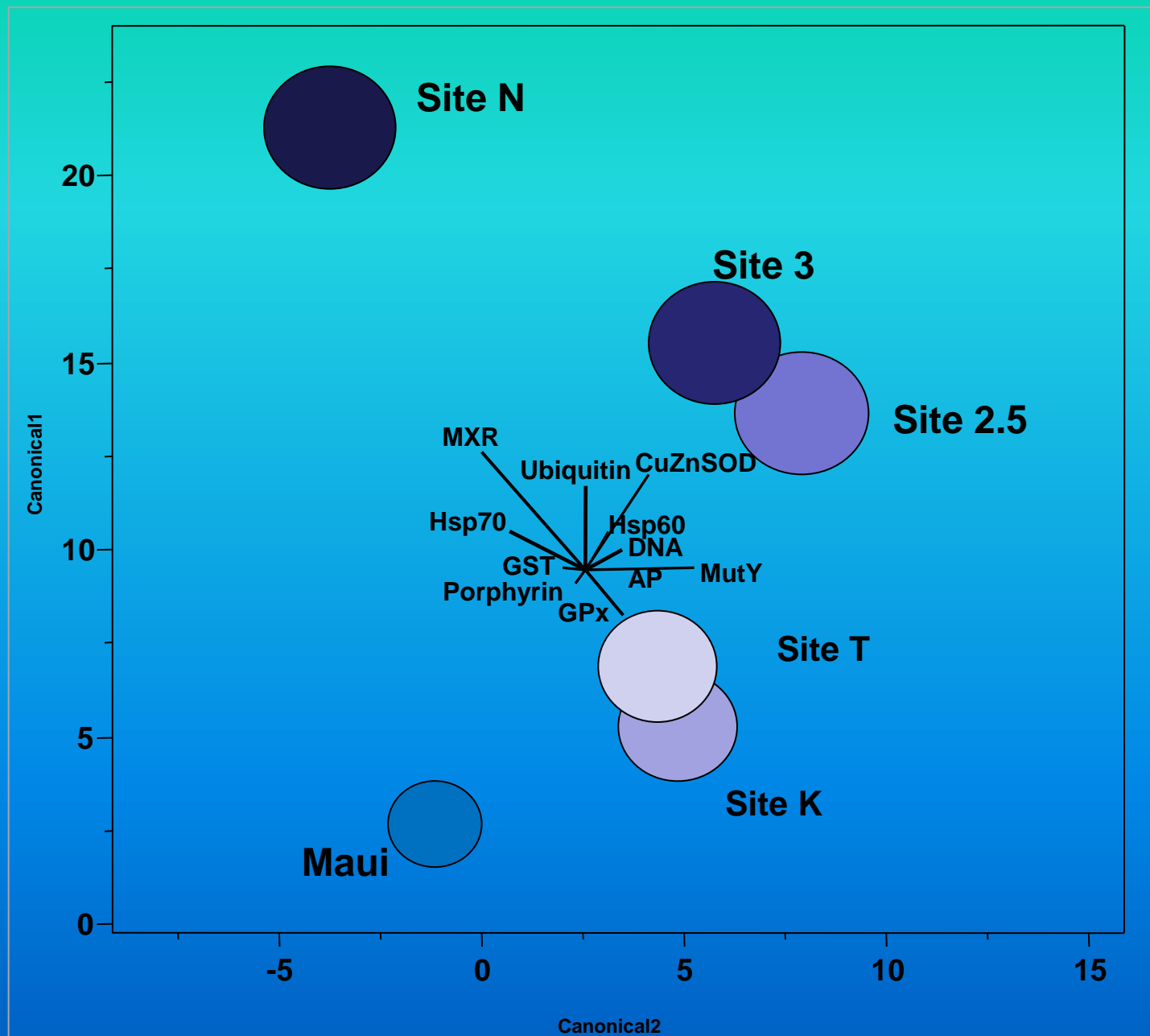


Credits: Teina Rongo

0 50 100

Kuli'ou'ou during December Storm





Multi-Xenobiotic Resistance Protein

Changes in Community Characteristics



Future Scenarios

Community Meetings – Ngermeduu Bay

